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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,584	10/24/2003	Mukerrem Cakmak	089498-0447	9481

39505 7590 12/26/2008

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EXAMINER	
LEE, RIP A	

ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
12/26/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/692,584	CAKMAK ET AL.	
	Examiner	Art Unit	
	RIP A. LEE	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *March 24, 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action follows a response filed on March 24, 2008. Claims 11-20 are pending.

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi *et al.* (U.S. 6,139,948) in view of Okabe *et al.* (U.S. 4,725,472) for the same reasons set forth in the previous office action dated March 22, 2007.

Example 1-4 of Kobayashi *et al.* teaches a process comprising the steps of blending polylactic acid and 0.5 parts by weight (0.3 vol %) of silica (average particle size of 7-50 nm; col. 5, line 42) and extruding the melt mix from a single screw extruder at 150-200 °C. The product was cooled on a casting roll at 30 °C to obtain unstretched film having an average thickness of 400 μm. In a subsequent step, the unstretched film was stretched in the machine direction with a hot roll at 60 °C and stretched in the transverse direction in a tenter at 70 °C. The resulting biaxially stretched film had a thickness of 0.1 μm. The reference does not indicate specifically that the product is quenched to yield an amorphous polymer, as recited in the instant claims.

Okabe *et al.* discloses a conventional process for making biaxially stretched polyester film. The steps involve extruding a melt mix of polyester and inert filler and quenching the molten extrudate on a casting drum to obtain a sheet or film. Biaxial drawing may be carried out in a known manner by sequential multi-stage procedure or a simultaneous single stage procedure (col. 4, lines 15-25).

It would have been obvious to one having ordinary skill in the art, based on evidence furnished in Okabe *at al.*, that the process step in Kobayashi *et al.*, in which film is cooled on a casting roll at 30 °C, is a quenching step. This notion is especially obvious in view of the fact that Kobayashi *et al.* does not provides any indication that this step is not unexceptional. Even if one having ordinary skill in the art lacked sufficient guidance, he would merely turn to Okabe *et al.* which teaches a conventional process for making polyester film. One of ordinary skill in the art would have found it obvious to quench the extrudate on a casting roll in order to obtain film quickly for the subsequent stretching process. Since this is a well-known process, one having ordinary skill in the art would have expected the combination of teachings to work with a reasonable expectation of success.

Kobayashi *et al.* is silent regarding to the amorphous nature of the quenched extrudate, however, it would have been obvious to one having ordinary skill in the art that the rapidly quenched melt, which has not been subjected to crystallization inducing cooling, would exhibit amorphous characteristics, especially in light of the fact that the polyester is aliphatic in nature.

Kobayashi *et al.* is also silent regarding the strain hardening phenomenon, however, in light of the fact the process described in the prior art is essentially the same as that recited in the instant claims, and in view of the fact that Kobayashi *et al.* teaches biaxial stretching of the product in order to obtain a film with excellent mechanical strength and durability, it would have been obvious to one having ordinary skill in the art that polyester film undergoes the claimed strain hardening.

Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference regarding the amorphous character of the polymer in Kobayashi *et al.* after quenching and regarding the presence of strain hardening in the stretched polymer. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

3. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian *et al.* (U.S. 6,407,155) in view of Haruta *et al.* (U.S. 3,773,609) or Ishibashi *et al.* (U.S. 5,180,626) for the same reasons set forth in the previous office action dated March 22, 2007.

Qian *et al.* relates to methods for making nanocomposite materials by forming a mixture of polymer matrix and nanoparticulate filler in the amount of 0.05-60 wt % and melt blending said mixture. Although the amount of nanoparticulate filler is not expressed in terms of a volume percentage, it would have been obvious to one of ordinary skill in the art to believe that the 0.05-60 wt % range encompasses the recited ranges of 0.01-10 vol %, 0.1-10 vol %, and 1-10 vol % ranges set forth in the present claims, especially in light of the fact that the range disclosed in the patent spans two orders of magnitude. Nanocomposites of the invention are used in fabrication of films (col. 20, line 64), and Qian *et al.* contemplates use of biaxial stretching of the film to increase dimensional stability (col. 21, lines 16-31). The prior art does not disclose the process of biaxial stretching of films.

Haruta *et al.* and Ishibashi *et al.* disclose conventional processes for making biaxially stretched polypropylene film. The steps involve melt blending resin and additives and extruding the melt at 240-280 °C. The extrudate is quenched on a cooling roll at 30-40 °C. In a subsequent step, the material is preheated at 155 °C and stretched simultaneously in the machine and transverse directions to provide a biaxially stretched film (Haruta *et al.*, example 2, lines 48-63 and Ishibashi *et al.*, example 1, col. 8, lines 43-55).

It would have been obvious to one having ordinary skill in the art to use the teaching in Haruta *et al.* and Ishibashi *et al.* in order to make biaxially stretched films from the composition of Qian *et al.* The combination is obvious because Qian *et al.* contemplates such an end use, and the secondary references furnish an otherwise obvious missing process step. Since biaxial stretching of polypropylene film is well-established in the art, one having ordinary skill in the art would have expected the combination of teachings to work with a reasonable expectation of success.

The references are silent regarding to the amorphous nature of the quenched extrudate, however, it would have been obvious to one having ordinary skill in the art that the rapidly

quenched melt, which has not been subjected to crystallization inducing cooling, would exhibit amorphous characteristics, especially in light of the fact that the polyester is aliphatic in nature.

The references are also silent regarding the strain hardening phenomenon, however, in light of the fact the process described in the prior art is essentially the same as that recited in the instant claims, and in view of the fact that Qian *et al.* teaches biaxial stretching of the product in order to obtain a film with excellent mechanical strength and durability, it would have been obvious to one having ordinary skill in the art that polypropylene film undergoes the claimed strain hardening.

Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference regarding the amorphous character of the polymer of Qian *et al.* after quenching and regarding the presence of strain hardening in the stretched polymer. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Response to Arguments

4. Applicant traverses the rejection of claims over Kobayashi *et al.* (hereinafter, "Kobayashi") in view of Okabe *et al.* (hereinafter, "Okabe").

Applicant submits that Kobyashi does not teach the need to quench the polymer composition to achieve an amorphous state because the reference does not address this particular claim limitation. Applicant concludes that since neither of the references mentions the term strain hardening, there is no reason for either to suggest or teach the need to quench a polymer composition to achieve an amorphous polymer composition. It is further submitted that not all polymers achieve an amorphous state below their melting point and then are capable of achieving strain hardening above their glass transition temperature in the rubbery state.

In Kobayashi's process, the extrudate is cooled on a casting roll to obtain an unstretched film. Okabe provides strong evidence that this constitutes a quenching step, and the person of ordinary skill in the art would have found it obvious to conclude that the corresponding step in Kobayashi is also a quenching step, regardless of whether Kobayashi utilizes the word

"quenching" in the text. In light of the fact that the polymer composition has not been stretched and that inventor intends to stretch the polymer to induce crystallinity into the polymer, a reasonable basis exists to believe that the polymer has amorphous character at this point in the process. The burden of proof was shifted to Applicant to establish any unobviousness differences regarding the state of the polymer. Applicant's arguments do not dispute that conclusion that Kobayashi *et al.*, in view of strong supporting evidence furnished in Okabe *et al.*, would disclose a quenching step. The mere allegation that 'not all polymers achieve an amorphous state below their melting point' neither meets, nor supplants, Applicant's burden of proof to establish an unobviousness difference with specific regard to the extrudate of Kobayashi's process.

Applicant submits that the reference does not teach the phenomenon of strain hardening. Applicant argues that nothing contained in the reference would motivate the skilled artisan to consult the reference with regard to strain hardening, nor is there any indication or teaching as to how to choose a nanoparticle for combination with a polymer in order to control the point at which strain hardening is induced. Applicant also states that absent explicit evidence or teaching as to why to add the nanoparticle to the polymer with regard to the property of strain hardening, inherency arguments can not be relied upon to reject claims.

This line of reasoning is not found persuasive for it is well settled that it is sufficient that the prior art clearly suggests doing what Applicants have done, although an underlying explanation of exactly why this should be done, other than to obtain the expected superior beneficial results, is not taught or suggested in the cited references. *In re Gershon*, 372 F.2d 535, 539 152 USPQ 602, 605 (CCPA 1967). The claims recite a process comprising four steps of blending polymer and nanoparticle, quenching, forming film, subjecting the film to strain hardening. Kobayashi, in view of evidence shown in Okabe, clearly suggests blending polymer and nanoparticle, extruding the mixture and quenching the extrudate. In a subsequent step, a film is formed from the composition, and in order to in order to obtain a film with excellent mechanical strength and durability, that is, to obtain expected superior beneficial results, the film heated and subjected to biaxial stretching. In view of the fact that Kobayashi discloses substantially the same four steps recited in the instant claims, it was deemed that the person of

ordinary skill in the art would have reasonable basis to believe that orientation of polymer by biaxial stretching results in strain hardening phenomenon in the polymer. Note also that the instant specification corroborates this notion: it is the addition of nanoparticles that imparts novel strain-hardening characteristics to cast films (page 4, line 26) and that stretching (uniaxially or multi-axially) of films so that the polymer chains become oriented in the stretch direction leads to strain hardening (page 6, lines 21-24). Thus, the burden of proof was shifted to Applicant to establish that strain hardening does not occur in Kobayashi's film. To date, Applicant has not met this burden of proof. Arguments of counsel can not take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997).

Finally, Applicant contends that Kobayashi teaches interchangeable use of lubricant and anti-blocking agents, or the combined use thereof. Applicant states that all examples, except for example 1-4 cited by examiner, do not address use of the anti-blocking agent taught therein. Applicant contends that a fair reading would lead one to use lubricant suggested therein, as set forth in the remaining examples, rather than the anti-blocking agent. Applicant's arguments do not detract from the fact that Kobayashi discloses cited example 1-4 which shows use of silica as the nanoparticulate filler.

In light of these considerations the rejection has been maintained.

Applicant traverses the rejection of claims over Qian *et al.* (hereinafter, "Qian") in view of Haruta *et al.* (hereinafter, "Haruta") or Ishibashi *et al.* (hereinafter, "Ishibashi"), indicating that Qian has been addressed previously; Applicant states that they "rely on those arguments in regard to the technical relevance of this reference to the subject claims" and "rely on the same under this rejection as it is equally applicable here." Based on the premise that combined references do not teach how to properly choose components to control strain hardening, dyslogistic boilerplate has been set forth, with the conclusion that a leap was made in combining references, which smacks of impermissible hindsight.

Applicant fails to address the current rejection which relies on the combination of references, Qian in view of Haruta or Ishibashi, rather than Qian alone. It is maintained that the

person of ordinary skill in the art would have found it obvious to carry out biaxial stretching of film because Qian intends to make such films and Haruta or Ishibashi furnishes the otherwise obvious method of how to carry out such a process. Applicant has not established why the person of ordinary skill in the art would not have found it obvious to use the process of Haruta or Ishibashi to carry out biaxial stretching of Qian's films.

In view of the fact that Kobayashi discloses substantially the same four steps recited in the instant claims, it was deemed that the person of ordinary skill in the art would have reasonable basis to believe that orientation of polymer by biaxial stretching results in strain hardening phenomenon in the polymer. Note also that the instant specification corroborates this notion: it is the addition of nanoparticles that imparts novel strain-hardening characteristics to cast films (page 4, line 26) and that stretching (uniaxially or multi-axially) of films so that the polymer chains become oriented in the stretch direction leads to strain hardening (page 6, lines 21-24). Thus, the burden of proof was shifted to Applicant to establish that strain hardening does not occur in Qian's film. To date, Applicant has not met this burden of proof. Arguments of counsel can not take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). Based on these considerations, the rejection has been maintained.

The objection of claim 12 has been withdrawn.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Art Unit 1796

December 18, 2008

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796